Floor Deck Specification



Division 05
Section 05 31 00
Steel Floor Deck

Part 1 - General

1.1 DESCRIPTION

1. General Requirements

Division 1, General Requirements, is a part of this specification and shall apply as if repeated here.

2. Work Furnished and Included:

1. Steel floor deck.
2. Shear Stud Connectors welded through the steel floor deck.
3. Openings cut in the deck for other trades.
4. Openings and edge reinforcing welded to deck.
5. Closures.
6. Metal closures and concrete retainer flashings to the depth of the concrete slab.

3. Related Work Not Included:

1. Bearing plates, shelf angles and other structural steel required to support the steel floor deck.
2. Reinforcing or structural framing of openings in the steel floor deck exceeding 300 mm (12 inches).
3. Clip angles at columns to support the steel floor deck.
4. Shear transfer elements for Shear Diaphragm Design.
5. Field painting including touch-up to the underside of the steel floor deck or the top chords of the flanges of supporting steel members where discoloration due to welding has occurred.
6. Cutting or drilling of holes for the attachment of suspended ceiling hangers. *(Specifier note: If ceiling hanger wires are installed through the steel floor deck, they must have a loop or pig-tail fully embedded in the poured concrete. The steel floor deck profile must not support the load applied to the hanger).*
7. Concrete topping.

1.2 STANDARDS

1. Design floor deck in accordance with the latest edition of:

1. C.S.A. S136 North American Specification for the Design of Cold Formed Steel Structural Members.
2. CAN/C.S.A. S16 Limit States Design of Steel Structures.
3. C.S.A. W47.1 Certification of Companies for Fusion Welding of Steel Structures.
4. C.S.A. W59 "Welded Steel Construction (Metal Arc Welding)".
5. Canadian Sheet Steel Building Institute (CSSBI) Standard 12M for Composite Steel Deck.
6. Canadian Sheet Steel Building Institute (CSSBI) Standard S2 Criteria for the Testing of Composite Slabs.
7. Canadian Sheet Steel Building Institute (CSSBI) Standard S3 Criteria for the Design of Composite Slabs.
8. National Building Code of Canada.

1.3 DESIGN CRITERIA

1. Design the steel floor deck using Limit States Design.
2. Design the steel floor deck to resist live and dead loads as specified and shown on the tender documents.
3. Where possible, span deck over four or more structural supports (3 continuous spans).
4. Design composite floor deck as a form to safely support the applicable loads before curing of the concrete. Deflection due to wet slab weight shall not exceed L/180 or 20 mm (3/4 inch). (Applicable loads include the weight of the wet concrete in finished thickness, plus a construction load of 1.0 kPa or 2.0 kN/m (21 psf or 137 plf).
5. Deflection of the floor system, after curing of the concrete, shall not exceed 1/360th of the span for the specified live loading.
6. Design metal edge and closure strips to contain concrete during pouring operations.
7. The steel floor deck manufacturer shall provide, on request, shear bond coefficients based on the Canadian Sheet Steel Building Institute Standard S2 Criteria for the Testing of Composite Slabs.

1.4 SUBMITTALS

1. Submit shop drawings in accordance with Section 01 33 23.

1. Indicate arrangement of steel floor deck including:
   1. Location, type and nominal thickness of deck
   2. Design loads
   3. Welding details
   4. Closure plates and flashing location and attachment
   5. Sufficient details to facilitate installation
   6. Size, layout and attachment procedure for Shear Stud Connectors, if applicable.

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1.5 HANDLING AND PROTECTION

1. Store steel floor deck in accordance with CSSBI Standards and Specifications.
2. Protect steel floor deck during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

Part 2 - Products

2.1 MATERIALS

1. Steel floor deck:

1. Fabricated from ASTM A653M SS Grade 230 galvanized steel, with a zinc coating of {ZF75 Glavanneal}, {Z275 Galvanized}, as designated by ASTM A653M.
2. Nominal steel core thickness of fluted profile shall be 0.76 mm (0.030 inches) minimum.
3. Composite floor deck profile to be manufactured with integral lugs on the web face of the flutes to achieve proper composite action.
4. Provide sections with interlocking side joints.

2. Accessories: Cover plates, cell closures, web stiffeners, edge strips and flashings to be the same material and finish as steel floor deck.

3. Shear Stud Connectors: Fabricated from solid fluxed, cold finished, low carbon steel to ASTM A108, Grades 1010 to 1020, with a minimum tensile strength of 415 MPa (60 ksi).

4. Acceptable Products:

1. For non-composite floor systems: Vicwest Floor Deck Profile [FD_____].
2. For composite floor systems: Vicwest Hi-Bond Profile [HB_____].

Part 3 - Execution

3.1 GENERAL

1. Examination: Examine work of other trades over which floor deck will be applied for conformity to approved shop drawings. Report all discrepancies to consultant before beginning work on the floor system.

2. Certification: The steel deck welders must be certified under C.S.A. W47.1 for fusion welding of steel floor decks.

3. Protection: Protect steel floor deck during construction in accordance with CSSBI standards.

3.2 INSTALLATION

1. Steel floor deck:

1. Install steel floor deck in accordance with C.S.A. S136 and CSSBI 12M.
2. Install deck free of dirt, scale or foreign matter.
3. Place deck in final position before securing to supporting members, ensuring minimum bearing on the structural support equal to the depth of the steel floor deck profile.
4. Fasten with fusion welds, size and spacing as shown on structural drawings, or 20 mm (3/4 inch) nominal top diameter welds at 300 mm (12 inches) on centre. Ensure welds are well within bearing width of supporting members.
5. Clinch side laps at 600 mm (24 inches) centres.

2. Closures:

1. Install closures in accordance with details indicated on tender drawings and approved shop drawings.

3. Openings:

1. Openings shall be located and marked on the steel floor deck by the General Contractor, prior to the steel deck installers leaving the site.
2. Install concrete retainer flashings on top of steel floor deck around marked openings. Optional wood forms may be supplied and installed by the General Contractor, for openings not marked per section 3.2.3.1. The General Contractor shall remove any wood forms and cut out the steel floor deck after the concrete has attained 75% of its design strength.
3. Openings smaller than 150 mm (6 inches) require no special concrete reinforcement.
4. Openings from 150 mm (6 inches) to 450 mm (18 inches) require steel reinforcing bars be embedded in the concrete around the periphery of the opening (refer to Section 03 20 00 Concrete Reinforcement and Section 03 30 00 Cast-in-Place Concrete).
5. Openings in excess of 450 mm (18 inches) require structural framing be installed to support the steel deck.

4. Shear Studs:

1. Tolerances: Shear Studs may vary 25 mm (1 inch) maximum from the location shown along the support. Studs may vary 6 mm (0.25 inch) maximum from the flute location shown on the drawing details. The minimum distance from the Stud base to the edge of a flange shall be (1) Stud diameter plus 3 mm with a preferred minimum of 38 mm.
2. Welding: Welding shall not be attempted when the surfaces are wet or exposed to falling rain or snow. Studs shall be installed as soon as possible after installation of steel floor deck profiles.
3. Quality Control: The first two Studs welded for each member type shall be bent 30˚ from vertical towards the nearest end of the member without failure. Machine-welded Studs shall have at least 1 in 100 Studs bent 15˚ from vertical towards the nearest end of the member. Hand-welded Studs shall have 10 Studs similarly tested. All studs shall be left in the bent condition. Do not straighten back to vertical.

3.3 CLEANING

1. Leave deck clean and well prepared for subsequent trades.

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